Kramer Electronics, Ltd.

USER MANUAL

Model:

VM-4HC

1:4 HDMI Distributor

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing your Kramer **VM-4HC** *1:4 HDMI Distributor* which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following items:

- **VM-4HC** 1:4 HDMI Distributor
- 5V DC power adapter
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

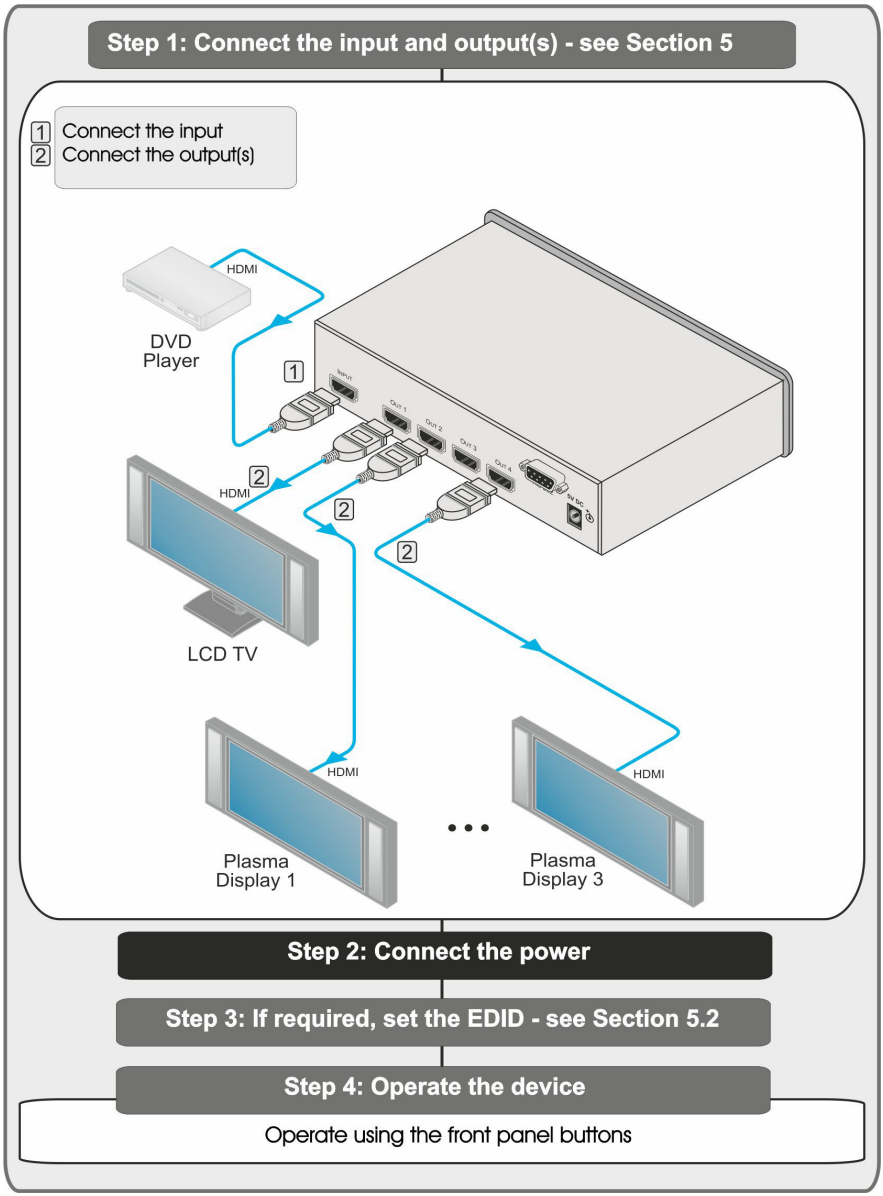
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

The Kramer **VM-4HC** is a high quality 1:4 HDMI distributor that accepts an HDMI input and distributes the signal to up to four outputs, thus making it a versatile, reliable component in a video system. The **VM-4HC** distributes signals having resolutions up to UXGA, including all HDTV formats.

In particular, the **VM-4HC**:

- Supports up to 2.25Gbps bandwidth per graphic channel[1]
- Equalizes and reclocks the data
- Has I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling and processing algorithm that ensures Plug and Play operation for HDMI systems
- Supports 3D Pass-Thru
- The ability to use a default[2] EDID or acquire the EDID from one output or from all connected outputs (Auto-mix)
- Includes five HDMI connectors, four output status LEDs, as well as EDID READ and SELECT buttons

The **VM-4HC** is housed in a desktop sized enclosure and is fed by a mains power adapter.

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[3] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality.

In particular, HDMI[4]:

- Provides a simple[5] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy[6] cable

1 Suitable for resolutions up to UXGA at 60Hz and for all HD resolutions

2 Lets you use the EDID default value when no display from which to read the EDID is connected

3 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

4 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

5 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

6 HDMI technology has been designed to use standard copper cable construction at up to 15 m (49ft)

- Supports standard, enhanced, high-definition video, and multi-channel digital audio[1] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable[2], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way CEC communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support existing high-definition video formats (720p, 1080i and 1080p, 2K and 4K) as well as standard definition formats such as NTSC or PAL

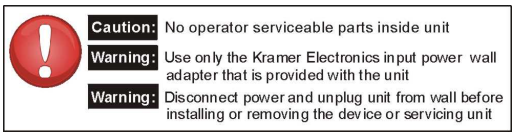
3.2 Defining the EDID

The Extended Display Identification Data (EDID[3]) is a data-structure, provided by a display, to describe its capabilities to a graphics card (that is connected to the display's source). The EDID enables the **VM-4HC** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 Recommendations for Best Performance

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your **VM-4HC** away from moisture, excessive sunlight and dust


Caution: No operator serviceable parts inside unit
Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit
Warning: Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

1 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

2 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

3 Defined by a standard published by the Video Electronics Standards Association (VESA)

4 Defining the VM-4HC 1:4 HDMI Distributor

Figure 1 and Table 1 define the front panel of the **VM-4HC** *1:4 HDMI Distributor*.

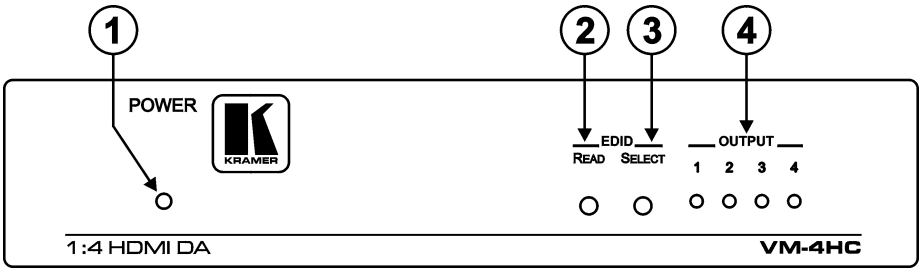


Figure 1: VM-4HC 1:4 HDMI Distributor Front Panel

Table 1: VM-4HC 1:4 HDMI Distributor Front Panel Features

#	Feature		Function
1	*POWER* LED		Lights red when the unit receives power
2	*EDID*	*READ* Button	Press to read the EDID of the selected output
3		*SELECT* Button	Press to cycle through the output EDID sources
4	*OUTPUT 1-4* LEDs		Lights green when an output(s) is connected and active; LEDs flash when selecting EDID (see Section 5.2)

Figure 2 and Table 2 define the rear panel of the **VM-4HC** *1:4 HDMI Distributor*.

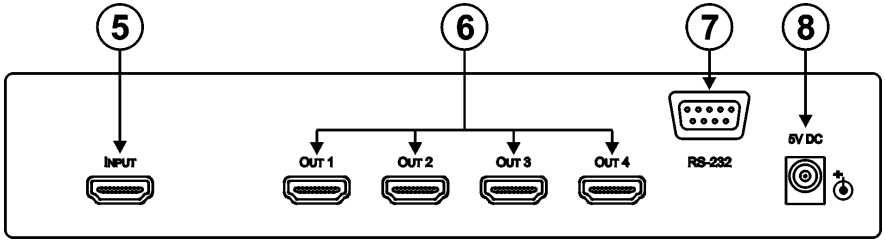


Figure 2: VM-4HC 1:4 HDMI Distributor Rear Panel

Table 2: VM-4HC 1:4 HDMI Distributor Rear Panel Features

#	Feature	Function
5	*INPUT* HDMI Connector	Connect to the HDMI source
6	*OUT 1-4* HDMI Connectors	Connect to the HDMI acceptors 1 to 4
7	*RS-232* 9-pin D-sub Connector	Not currently in use
8	*5V DC* Power Connector	Connect to the power adapter, center pin positive

5 Connecting the VM-4HC 1:4 HDMI Distributor

This section describes:

- Connecting the **VM-4HC** (see Section 5.1)
- Acquiring the EDID (see Section 5.2)

5.1 Connecting the VM-4HC

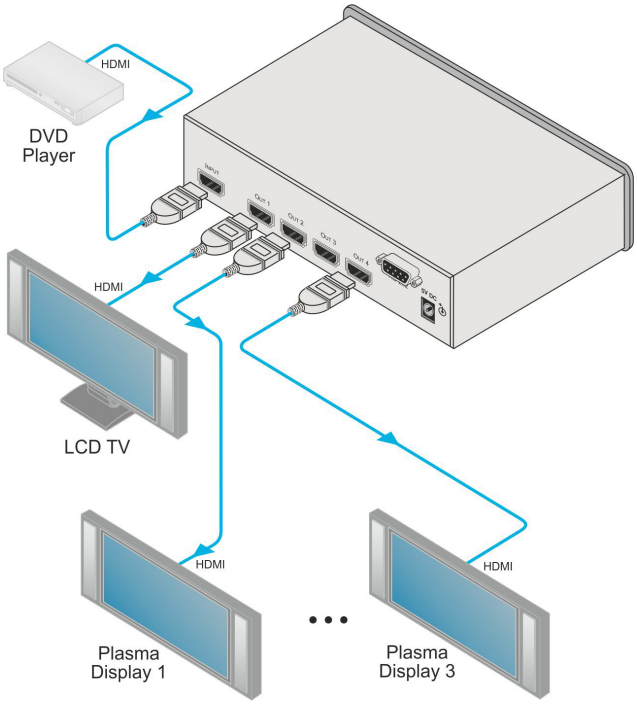


Figure 3: Connecting the VM-4HC 1:4 HDMI Distributor

To connect[1] the VM-4HC as illustrated in the example in Figure 3:

1. Connect[2] the HDMI source, for example, a DVD player to the INPUT connector.

1 Switch off the power to each device before connecting it to your VM-4HC. After connecting your VM-4HC, switch on its power and then switch on the power to each device

2 Using the Kramer HDMI copper cables

2. Connect the HDMI OUTPUT connectors[1] to up to 4 HDMI acceptors as follows:
   - OUTPUT 1 to display device 1 (for example, a plasma display)
   - OUTPUT 2 to display device 2 (for example, a plasma or LCD display)
   - OUTPUT 3 to display device 3 (for example, an LCD TV)
   - OUTPUT 4 to display device 4 (for example, a plasma display)
3. Connect the power adapter to the device and to the mains electricity (not shown in Figure 3).
4. If required, acquire the EDID (see Section 5.2).

5.2 Acquiring the EDID

Initially[2] the **VM-4HC** operates with the factory default EDID[3] stored in the non-volatile memory. The source reads the EDID from the device when the device is plugged in or powered on.

The EDID[4] can be acquired from:

- One of the outputs
- The default EDID
- Up to four connected outputs using the Auto-mix Mode[5]

Repeatedly pressing the EDID SELECT button cycles through the EDID sources in the following order[6]:

- Output 1 (Output 1 LED lights)
- Output 2 (Output 2 LED lights)
- Output 3 (Output 3 LED lights)
- Output 4 (Output 4 LED lights)
- Default EDID (all LEDs light)
- Auto-Mix EDID (the LEDs flash in a running sequence)

1 As required. Up to four outputs can be connected. Not all outputs need to be connected

2 This is usually done only once when the unit is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary

3 The VM-4HC reads the EDID, which is stored in the non-volatile memory

4 This is usually done only once when the machine is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary

5 The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID

6 If you attempt to acquire the EDID from an output that is not connected the default EDID is acquired

To store the selected EDID, press EDID READ as described in the following example[1].

To select the EDID from Output 3:

1. Press the EDID SELECT button repeatedly until OUTPUT 3 LED lights.
2. Press the EDID READ button.
   When the LED stops flashing the EDID from Output 3 is stored at the input.

Pressing the EDID SELECT button briefly once causes the relevant LEDs to indicate which EDID is stored at the input, as follows:

- OUTPUT 1 LED flashes—the EDID from OUTPUT 1 was the last acquired
- OUTPUT 2 LED flashes—the EDID from OUTPUT 2 was the last acquired, and so on
- All OUTPUT LEDs flash—the default EDID was the last acquired
- All OUTPUT LEDs flash sequentially—the Auto-Mix[2] EDID was the last acquired

1 To cancel the EDID modification wait for a few seconds without touching any button

2 The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID

6 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications[1] of the VM-4HC 1:4 HDMI Distributor

INPUT:	1 HDMI connector
OUTPUTS:	4 HDMI connectors
BANDWIDTH:	Supports up to 2.25Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	EDID SELECT and READ buttons
INDICATOR LEDs:	POWER, OUTPUTS 1-4
POWER SOURCE:	5V DC, 1.1A
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	21.5cm x 16.3cm x 4.4cm (8.5" x 6.4" x 1.7") W, D, H
WEIGHT:	0.6kg (1.32lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	Kramer HDMI cables[2], Rack adapter kit RK-3T

1 Specifications are subject to change without notice

2 For best results, use Kramer cables such as the C-HM/HM series, the C-HM/DM series and/or our HDMI over fiber optics C-FOHM/FOHM series

7 Default EDID

```
Monitor
  Model name..... VM-4HC
  Manufacturer..... KRM
  Plug and Play ID..... KRM0023
  Serial number..... 505-707455010
  Manufacture date..... 2009, ISO week 10
  Filter driver..... None
  ------------------------
  EDID revision..... 1.3
  Input signal type..... Digital
  Color bit depth..... Undefined
  Display type..... RGB color
  Screen size..... 520 x 320 mm (24.0 in)
  Power management..... Standby, Suspend, Active off/sleep
  Extension blocs..... 1 (CEA-EXT)
  ------------------------
  DDC/CI..... n/a

Color characteristics
  Default color space..... Non-sRGB
  Display gamma..... 2.20
  Red chromaticity..... Rx 0.674 - Ry 0.319
  Green chromaticity..... Gx 0.188 - Gy 0.706
  Blue chromaticity..... Bx 0.148 - By 0.064
  White point (default).... Wx 0.313 - Wy 0.329
  Additional descriptors... None

Timing characteristics
  Horizontal scan range.... 30-83kHz
  Vertical scan range..... 56-76Hz
  Video bandwidth..... 170MHz
  CVT standard..... Not supported
  GTF standard..... Not supported
  Additional descriptors... None
  Preferred timing..... Yes
  Native/preferred timing.. 1280x720p at 60Hz (16:10)
    Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync

Standard timings supported
     720 x  400p at  70Hz - IBM VGA
     640 x  480p at  60Hz - IBM VGA
     640 x  480p at  75Hz - VESA
     800 x  600p at  60Hz - VESA
     800 x  600p at  75Hz - VESA
    1024 x  768p at  60Hz - VESA
    1024 x  768p at  75Hz - VESA
    1280 x 1024p at  75Hz - VESA
    1280 x 1024p at  60Hz - VESA STD
    1600 x 1200p at  60Hz - VESA STD
    1152 x  864p at  75Hz - VESA STD

EIA/CEA-861 Information
  Revision number..... 3
  IT underscan..... Supported
  Basic audio..... Supported
  YCbCr 4:4:4..... Supported
  YCbCr 4:2:2..... Supported
  Native formats..... 1
  Detailed timing #1..... 1920x1080p at 60Hz (16:10)
    Modeline..... "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
  Detailed timing #2..... 1920x1080i at 60Hz (16:10)
    Modeline..... "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
  Detailed timing #3..... 1280x720p at 60Hz (16:10)
    Modeline..... "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
  Detailed timing #4..... 720x480p at 60Hz (16:10)
    Modeline..... "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync

CE video identifiers (VICs) - timing/formats supported
    1920 x 1080p at  60Hz - HDTV (16:9, 1:1)
    1920 x 1080i at  60Hz - HDTV (16:9, 1:1)
```

1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
720 x 480p at 60Hz - EDTV (16:9, 32:27)
720 x 480p at 60Hz - EDTV (4:3, 8:9)
720 x 480i at 60Hz - Doublescan (16:9, 32:27)
720 x 576i at 50Hz - Doublescan (16:9, 64:45)
640 x 480p at 60Hz - Default (4:3, 1:1)
NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)
LPCM 2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE vendor specific data (VSDB)
IEEE registration number. 0x000C03
CEC physical address..... 1.0.0.0
Maximum TMDS clock..... 165MHz

CE speaker allocation data
Channel configuration.... 2.0
Front left/right..... Yes
Front LFE..... No
Front center..... No
Rear left/right..... No
Rear center..... No
Front left/right center.. No
Rear left/right center... No
Rear LFE..... No

Report information
Date generated..... 15-Dec-11
Software revision..... 2.60.0.972
Data source..... File
Operating system..... 5.1.2600.2.Service Pack 3

Raw data
00,FF,FF,FF,FF,FF,FF,00,2E,4D,23,00,01,01,01,01,0A,13,01,03,80,34,20,78,EA,B3,25,AC,51,30,B4,26,
10,50,54,A5,4B,00,81,80,A9,40,71,4F,01,01,01,01,01,01,01,01,01,01,01,1D,00,72,51,D0,1E,20,6E,28,
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00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,47

LIMITED WARRANTY

We warrant this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by us or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: “Radio frequency devices Subpart B Unintentional radiators”

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

  * FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit www.kramerelectronics.com **where updates to this user manual may be found. We welcome your questions, comments and feedback.**

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
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E-mail: info@kramerel.com
P/N: 2900-000716 REV 1